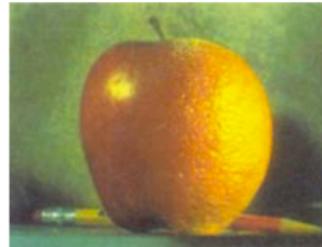


2. Image Formation



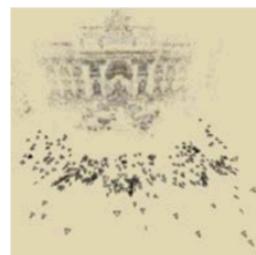
3. Image Processing



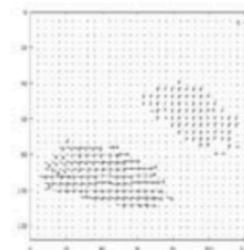
4. Features



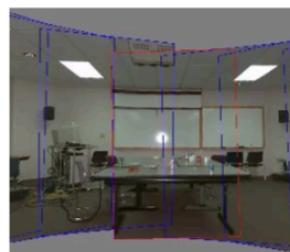
5. Segmentation



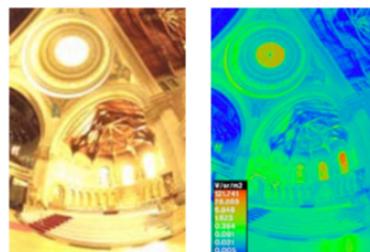
6-7. Structure from Motion



8. Motion



9. Stitching



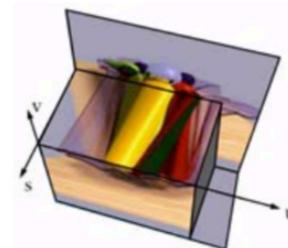
10. Computational Photography



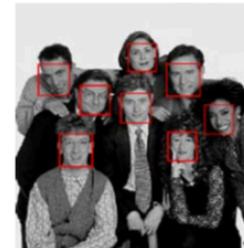
11. Stereo



12. 3D Shape

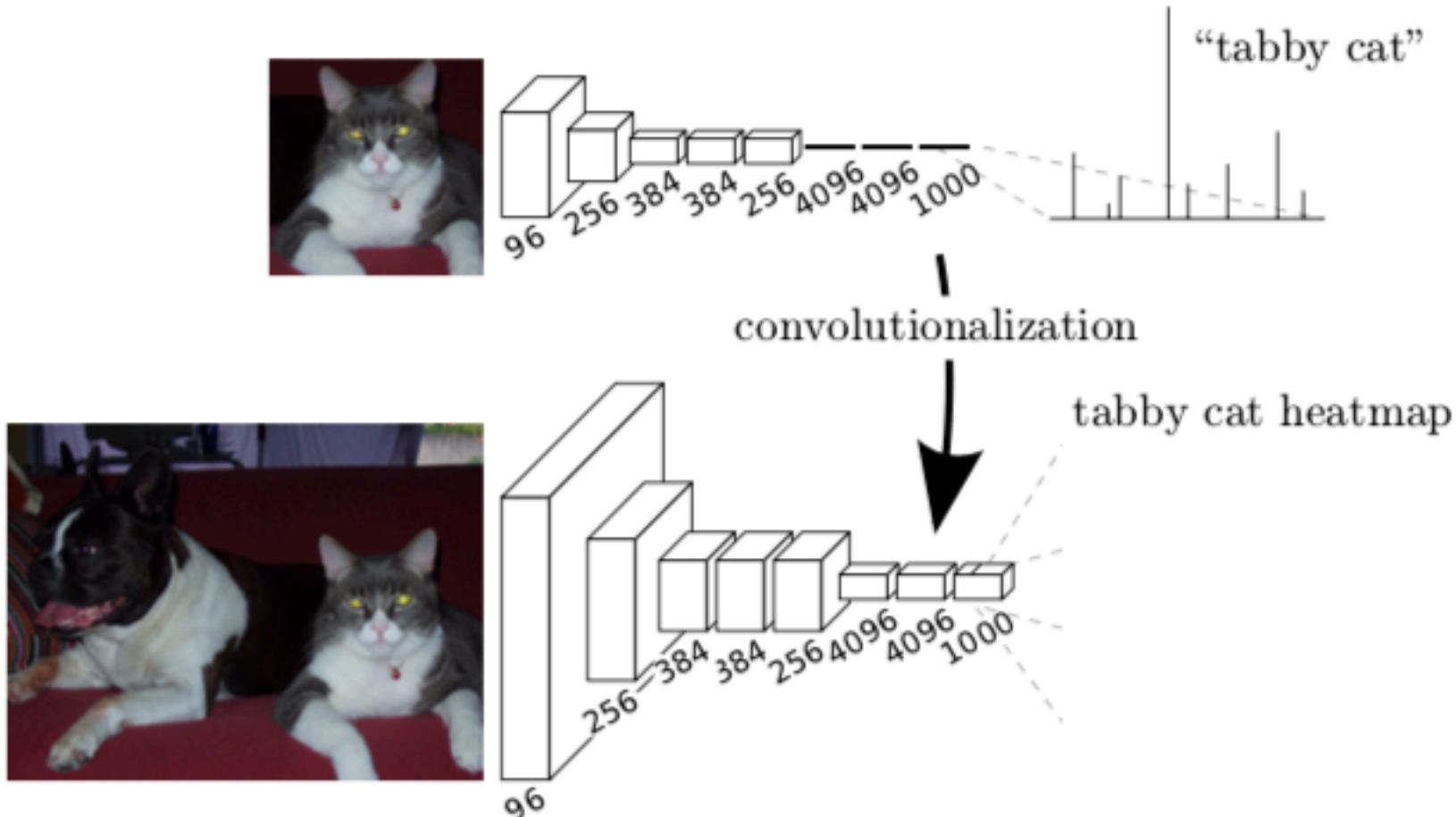


13. Image-based Rendering



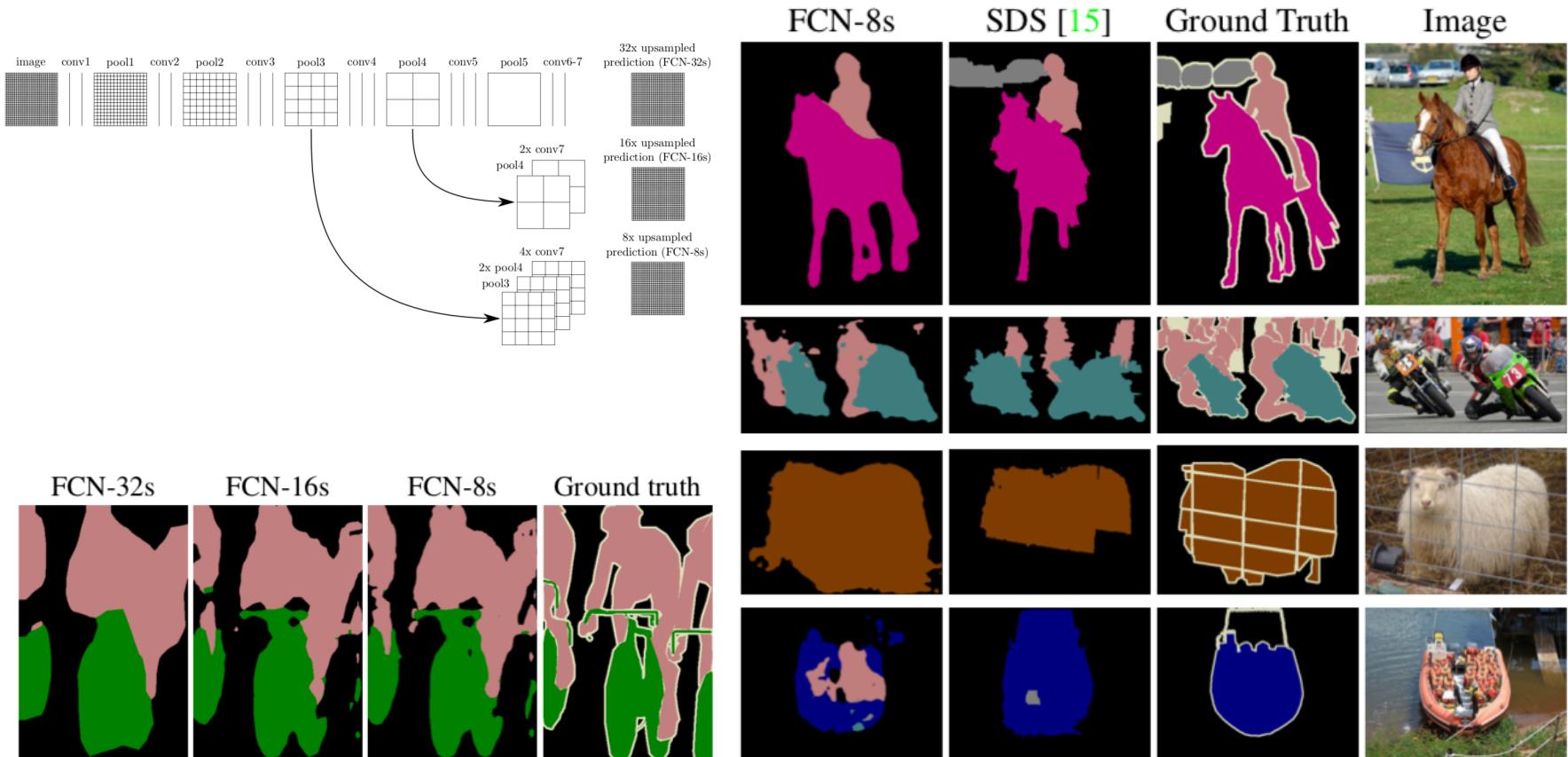
14. Recognition

# Fully convolutional nets...



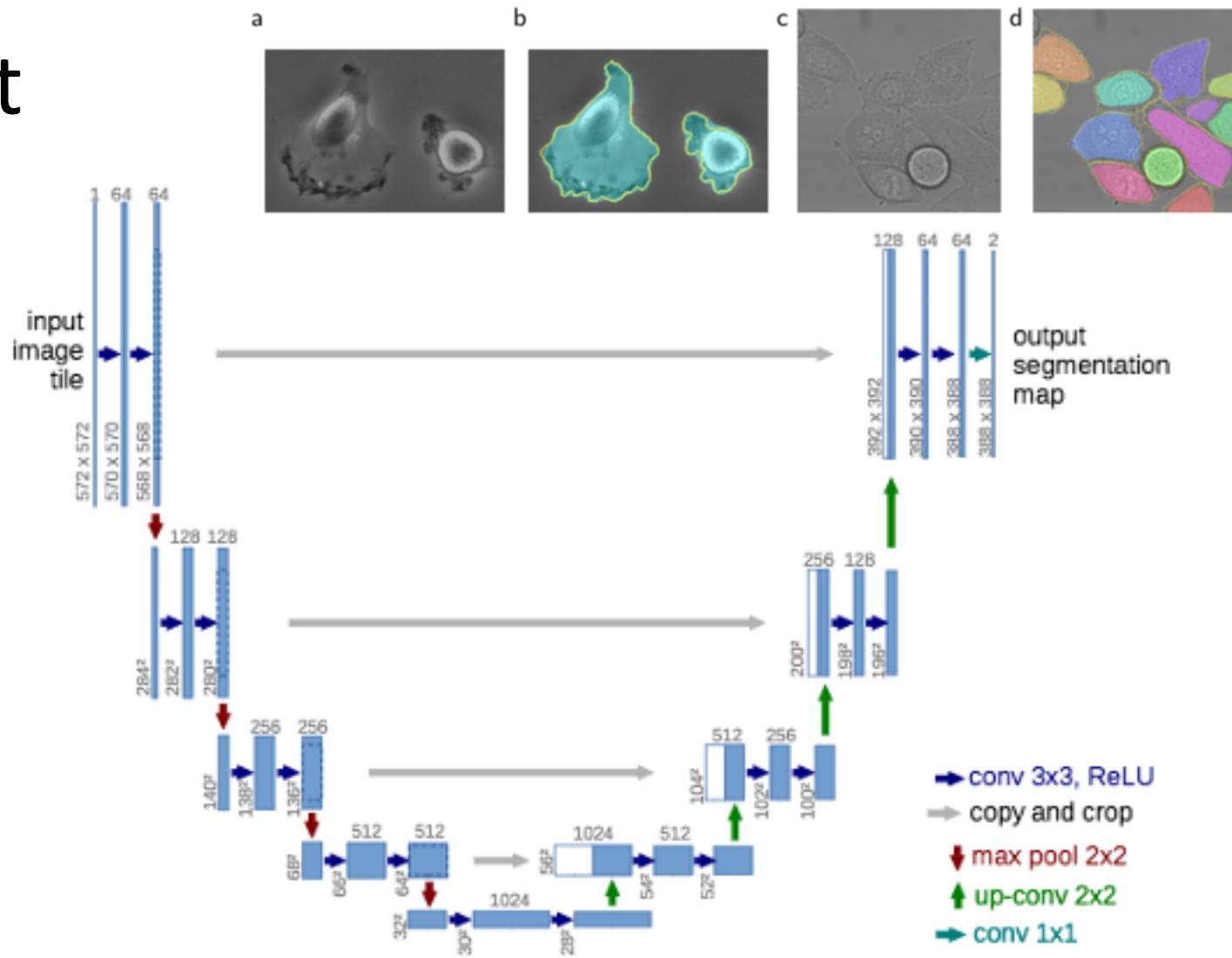
- “Expand” trained network to any size

# ...for segmentation



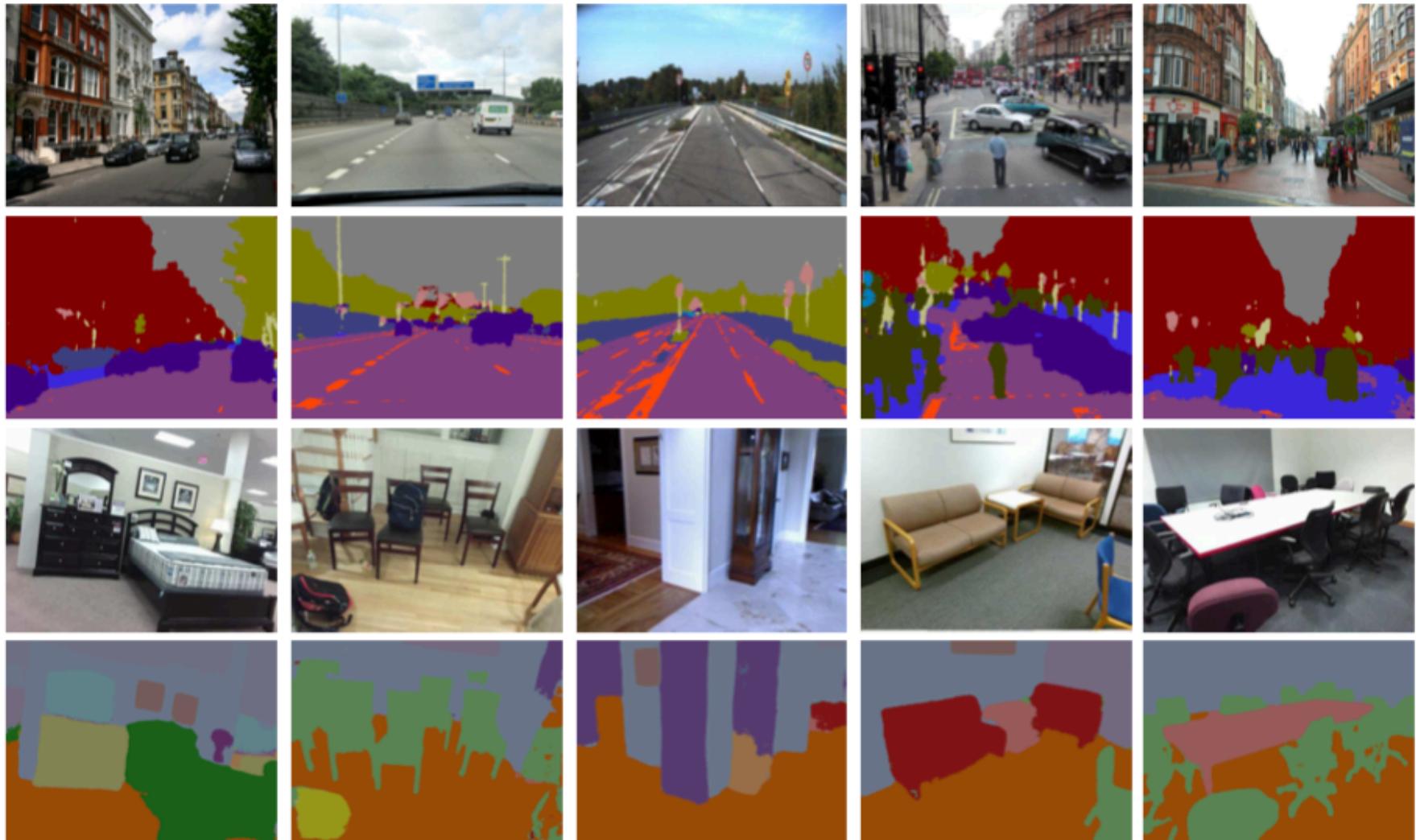
- Complicated upsampling strategies...
- Results not yet great

# U-Net



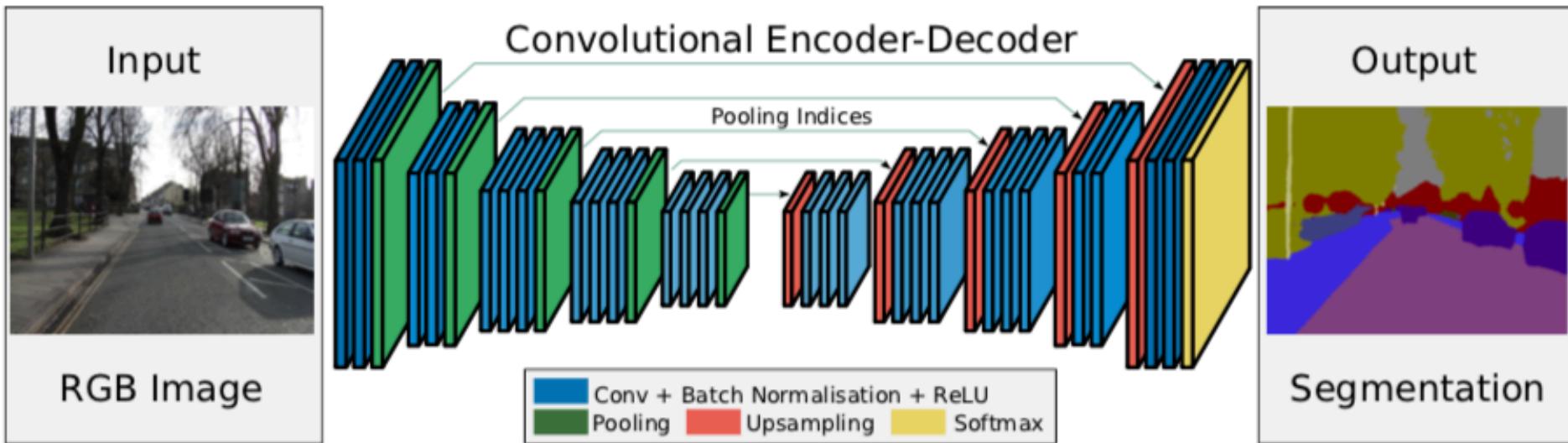
- Builds on FCN, Contract-expand with skip...
- Almost symmetric, many channels at bottom!

# Segnet



Segnet: A deep convolutional encoder-decoder architecture for image segmentation  
V Badrinarayanan, A Kendall, R Cipolla - PAMI 2017

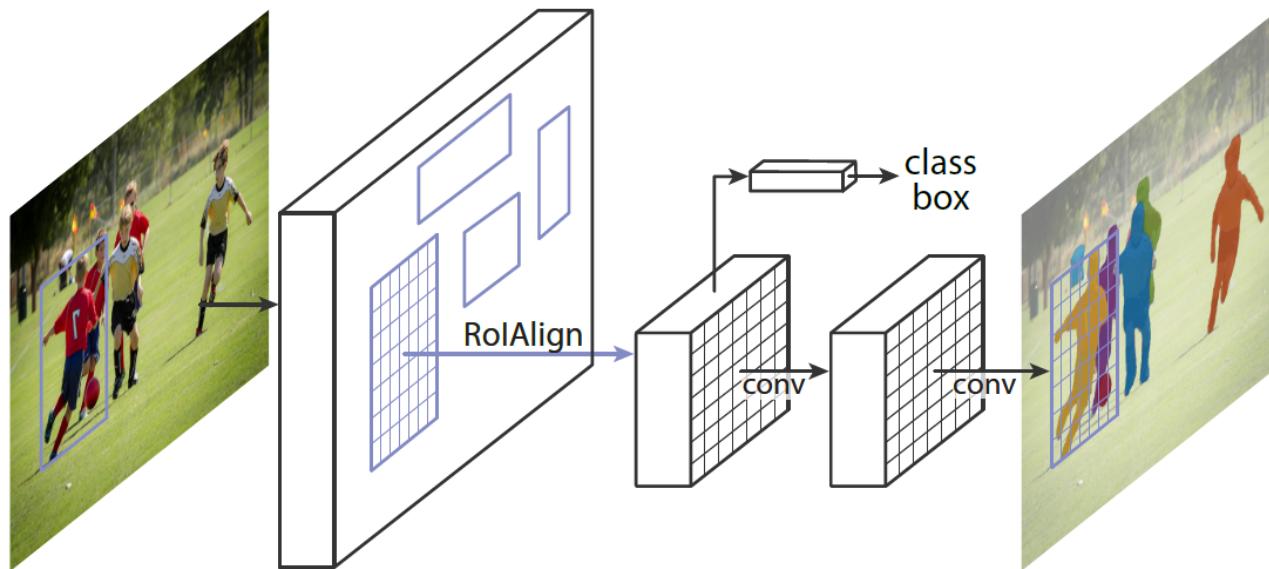
# Segnet



- Eliminates need to learn the upsampling

# Mask-RCNN...

- Neural networks to learn both local feature affinities and top-down context



- He et al., “[Mask R-CNN](#),” ICCV 2017 (Best paper)

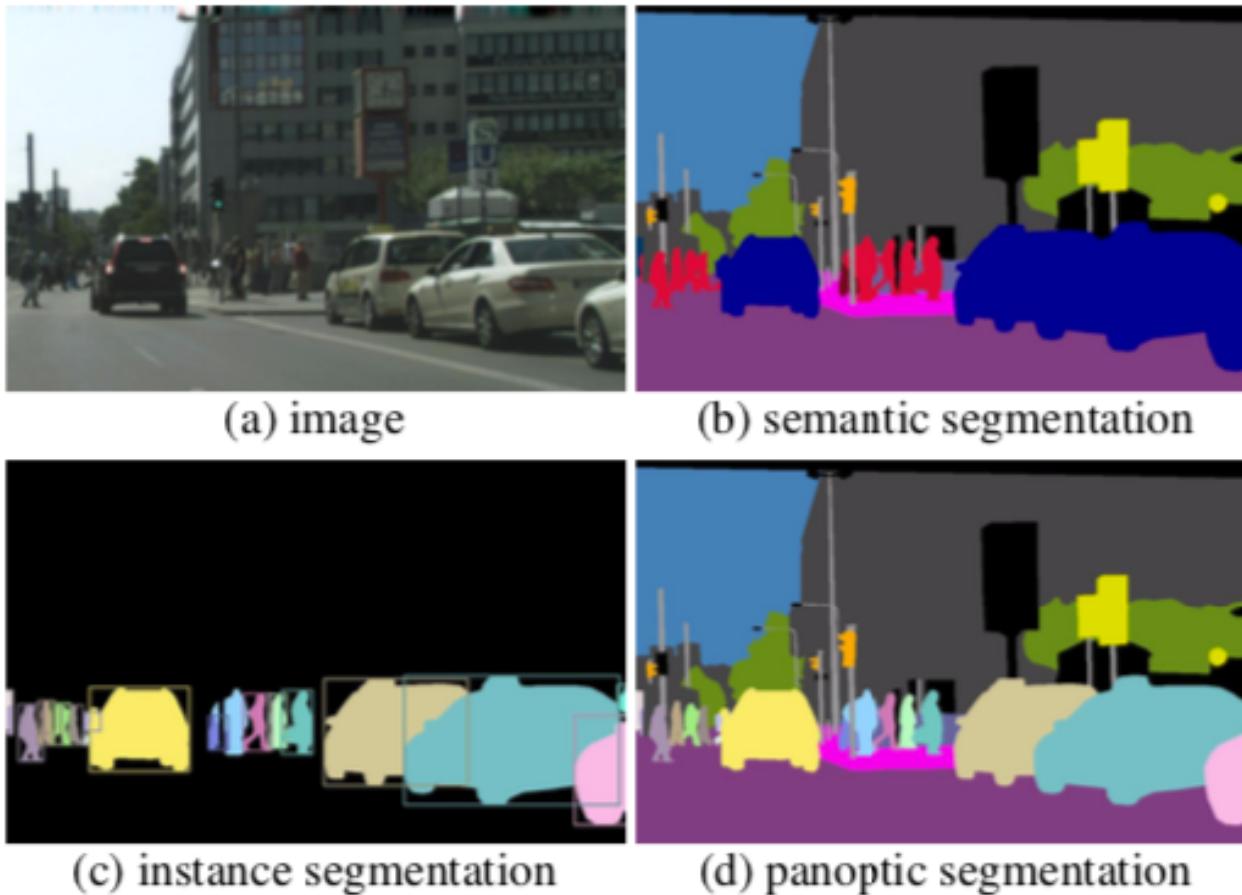
# Mask-RCNN...

- Results



- He et al., “[Mask R-CNN](#),” ICCV 2017 (Best paper)

# “Panoptic” Segmentation



- Segnet = semantic segmentation (every pixel)
- Mask-RCNN = instance segmentation (objects)
- Panoptic = combined

# Panoptic Feature Pyramid Networks



- Uses FPN architecture
- 2 heads

